General

Guideline Title

Recommendations on screening for type 2 diabetes in adults.

Bibliographic Source(s)

Canadian Task Force on Preventive Health Care. Recommendations on screening for type 2 diabetes in adults. CMAJ. 2012 Oct 16;184(15):1687-96. [51 references] PubMed

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Feig DS, Palda VA, Lipscombe L. Screening for type 2 diabetes mellitus to prevent vascular complications: updated recommendations from the Canadian Task Force on Preventive Health Care. CMAJ 2005 Jan 18;172(2):177-80. [44 references]

A complete list of planned reviews, updates, and revisions is available under the What's New section at the Canadian Task Force on Preventive Health Care (CTFPHC) Web site .

Recommendations

Major Recommendations

Grades of recommendation grades (strong, weak) and quality of evidence (high, moderate, low, very low) are defined at the end of the "Major Recommendations" field.

Adults at Low to Moderate Risk

For adults at low to moderate risk of diabetes (determined with the use of a validated risk calculator*†), the Task Force recommends not routinely screening for type 2 diabetes. (Weak recommendation; low-quality evidence)

Adults at High Risk

For adults at high risk of diabetes (determined with the use of a validated risk calculator*†), the Task Force recommends routinely screening every 3–5 years with glycated hemoglobin (A1C)‡. (Weak recommendation; low-quality evidence)

Adults at Very High Risk

For adults at very high risk of diabetes (determined with the use of a validated risk calculator*†), the Task Force recommends routine screening annually with A1C‡. (Weak recommendation, low-quality evidence)

*Risk of diabetes developing within 10 years: low risk = 1/100–1/25 (1%–4%); moderate risk = 1/6 (17%); high risk = 1/3 (33%); very high risk = 1/2 (50%). For adults ≥ 18 years of age, the Task Force suggests risk calculation at least every 3–5 years.

†FINDRISC (the Finnish Diabetes Risk Score) has been selected as the preferred validated risk calculator, but CANRISK (the Canadian Diabetes Risk Assessment Questionnaire) is an acceptable alternative. Factors considered in FINDRISC and CANRISK are age, obesity, history of elevated glucose levels, history of hypertension, family history of diabetes, limited activity levels, and diet with limited intake of fruits and vegetables. The CANRISK questionnaire can be found via the Public Health Agency of Canada (PHAC) Web site .

‡A1C has been selected as the preferred blood test, but fasting glucose measurement and the oral glucose tolerance test are acceptable alternatives. An A1C level of 6.5% or greater is recommended as the threshold for diagnosing diabetes, but values less than 6.5% do not exclude diabetes diagnosed using glucose tests. A1C should be measured using a standardized, validated assay.

Definitions:

Quality of Evidence

Evidence is judged as high quality when the Task Force is highly confident that the true effect lies close to that of the estimate of the effect. For example, evidence is judged as high quality if all of the following apply: there is a wide range of studies included in the analyses with no major limitations, there is little variation between studies, and the summary estimate has a narrow confidence interval.

Evidence is judged as moderate quality when the Task Force considers that the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different. For example, evidence might be judged as moderate quality if any of the following applies: there are only a few studies and some have limitations but not major flaws, there is some variation between studies, or the confidence interval of the summary estimate is wide.

Evidence is judged to be low or very low quality when the true effect may be substantially different from the estimate of the effect. For example, evidence might be judged as low quality if any of the following applies: the studies have major flaws, there is important variation between studies, or the confidence interval of the summary estimate is very wide.

Grading of Recommendations

Recommendations are graded according to the Grading of Recommendations Assessment, Development and Evaluation system (GRADE). GRADE offers two strengths of recommendation: strong and weak. The strength of recommendation is based on the quality of supporting evidence; the degree of uncertainty about the balance between desirable and undesirable effects; the degree of uncertainty or variability in values and preferences; and the degree of uncertainty about whether the intervention represents a wise use of resources.

- Strong recommendations are those for which the task force is confident that the desirable effects of an intervention outweigh its undesirable effects (strong recommendation for an intervention) or that the undesirable effects of an intervention outweigh its desirable effects (strong recommendation against an intervention). A strong recommendation implies that most people will be best served by the recommended course of action.
- Weak recommendations are those for which the desirable effects probably outweigh the undesirable effects (weak recommendation for an intervention) or undesirable effects probably outweigh the desirable effects (weak recommendation against an intervention) but appreciable uncertainty exists. A weak recommendation implies that most people would want the recommended course of action but that many would not. For clinicians, this means they must recognize that different choices will be appropriate for each person, and they must help each person arrive at a management decision consistent with his or her values and preferences. Policy-making will require substantial debate and involvement of various stakeholders. Weak recommendations result when the balance between desirable and undesirable effects is small, the quality of evidence is lower, and there is more variability in the values and preferences of patients.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Type 2 diabetes

Guideline Category

Prevention

Risk Assessment

Screening

Clinical Specialty

Cardiology

Endocrinology

Family Practice

Internal Medicine

Preventive Medicine

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Physician Assistants

Physicians

Guideline Objective(s)

To update the 2005 Canadian Task Force on Preventive Health Care recommendations on screening asymptomatic adults for type 2 diabetes

Target Population

Asymptomatic adults (18 years of age or older) at low-to-moderate, high, or very high risk of type 2 diabetes

Note: The guideline does not apply to people with symptoms of diabetes or those who are at risk of type 1 diabetes.

Interventions and Practices Considered

1. Screening for type 2 diabetes using glycated hemoglobin (A1C), fasting glucose measurement, or the oral glucose tolerance test
2. Using a validated risk calculator to establish risk of diabetes (e.g., Finnish Diabetes Risk Score [FINDRISC] or the Canadian Diabetes Risk Assessment Questionnaire [CANRISK])
3. Screening frequency (based on risk of diabetes)
4. Management of other cardiovascular risk factors (e.g., obesity, physical inactivity, tobacco use, hypertension and dyslipidemia)

Major Outcomes Considered

- Diabetes-related mortality (all-cause, cardiovascular)
- Diabetes-related morbidity/complications (e.g., myocardial infarction, stroke, angina, blindness, end stage renal disease, severe retinopathy)
- Harms associated with screening (anxiety, depression)
- Quality of life
- Patient preferences and values

- Cost-effectiveness
- Sensitivity, specificity, accuracy, reliability, prevalence, and feasibility of screening tests
- Differences in glycated hemoglobin (A1C)
- Incidence of type 2 diabetes
- Frequency of type 2 diabetes diagnosis

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Note from the National Guideline Clearinghouse (NGC): A systematic evidence review was prepared by the Evidence Review and Synthesis Centre at McMaster University for the Canadian Task Force on Preventive Health Care (CTFPHC) (see the "Availability of Companion Documents" field).

Search Strategies

To update the 2005 Canadian Task Force on Preventive Health Care (CTFPHC) Screening for Type 2 Diabetes, the literature search for this review replicated and updated the search conducted by the US Preventive Services Task Force (USPSTF) review in 2008.

The USPSTF searched MEDLINE® and the Cochrane Library for relevant English language systematic reviews, randomized controlled trials, and observational studies published between March 2001 and July 2007, related to the questions regarding diabetes screening, and potential adverse effects. Clinical Trials.gov was also searched for relevant trials. To answer Key Questions 1 and 2 the same search strategy was implemented, and all searches were updated from 2007 to February 2012. Also, for Key Questions 1 and 2, a targeted search of the literature (identifying randomized controlled trials [RCTs] that relate to major outcomes) was conducted 2 weeks prior to the release. EMBASE was not searched, as it was not searched in the original USPSTF review (see the "Description of Methods Used to Formulate the Recommendations" field for list of Key and Contextual questions).

Additional searches were conducted to answer the contextual questions; examining cost effectiveness of screening, patient values and preferences, risk factors to guide screening, screening in subgroups and populations, clinical benefits and harms of early treatment of type 2 diabetes, clinical benefits and harms of treatment for prediabetes, process and outcome performance measures and indicators, risk assessment tools and diagnostic tests. The same databases were searched from 2005 to February 2011. For risk assessment tools and diagnostic tests databases were searched from January 2001 to November 2011. A specific search of the grey literature (non-published or indexed literature) was also completed to find relevant Canadian data using the search terms "diabetes AND screening," "diabetes screening AND Canada," and "diabetes screening AND costs." Reference lists of key articles were also reviewed. A separate search was conducted to search for modeling studies. Detailed search strategies are listed in Appendices 4-6 of the systematic review document (see the "Availability of Companion Documents" field).

The population of interest for this review includes asymptomatic adults 18 years of age or older who are at average and moderate risk or high risk (see Appendix 3 of the systematic review document) for type 2 diabetes complications. Non-insulin dependent diabetes will be presumed to be type 2 diabetes. The USPSTF review included adults over the age of 20 years. The search was not redone for studies that included participants between the ages of 18 and 20 years for 2001 to July 2007; however, any new reports since July 2007 that studied people 18 years and over were included.

Study Selection

Eligible studies included asymptomatic adults 18 years or older at average or high risk for type 2 diabetes complications. Study designs for effectiveness of screening fasting plasma glucose, oral glucose tolerance test, or glycated hemoglobin (A1c) included randomized controlled trials or systematic reviews and meta-analyses and observational studies with a comparison group and intermediate (incidence of type 2 diabetes,

differences in A1c levels, and frequency of type 2 diabetes diagnosis) or final outcomes (all-cause mortality, cardiovascular mortality, myocardial infarction, stroke, angina, blindness, end stage renal disease, severe retinopathy). For harms, observational studies, RCTs, systematic reviews, and meta-analyses were included if they reported on anxiety and/or depression related to screening. For both effectiveness and harms the included studies had to have a non-screen comparison group.

For Contextual Question 1, examining the cost effectiveness of screening, no systematic reviews or RCTs were identified in the search; available observational and simulation modeling studies were included. Observational studies relevant to Contextual Questions 2 to 7, (examining patient values and preferences, risk factors to guide screening, screening in subgroups and populations, clinical benefits and harms of early treatment for type 2 diabetes, clinical benefits and harms of treatment of prediabetes, and process and outcome performance measures or indicators) were included if there were no data available from systematic reviews and/or RCTs. To address Contextual Questions 8 and 9, the Task Force identified high quality systematic reviews; appraised with AMSTAR (a measurement tool for assessment of multiple systematic reviews), and included relevant primary studies published after the end of the search used in the systematic review to November 2011.

The titles and abstracts were reviewed in duplicate by members of the synthesis team; any article marked for inclusion by either team member went on to full text rating.

Limitations

There are several limitations associated with this review. The search was limited to only those databases searched in the USPSTF review; only English language papers were included in the USPSTF search and only English and French were included in this update; only MEDLINE® and Cochrane databases were searched. EMBASE would be a logical database for searching for this question, but this was not done for the current review as the USPSTF review search strategy was the initial framework for this update. The Task Force found no new trials that examined the effectiveness of screening for type 2 diabetes. The studies found for the harms (anxiety) of screening were too heterogeneous for a meta-analysis.

The search for information about patient values and preferences, and special populations was focused and limited by a short timeframe and few databases. A systematic review process was not undertaken for questions about patient values and preferences, and special populations; rather it was a rapid review.

Number of Source Documents

Of the 134 studies that were quality appraised only six studies addressed the key questions. For Key Question 1, one new cohort study, two modeling studies, and one randomized controlled trial were found, and for Key Question 2, two new studies were found. The remaining 131 papers were available for consideration in answering the Contextual Questions.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Quality of Evidence

Evidence is judged as high quality when the Task Force is highly confident that the true effect lies close to that of the estimate of the effect. For example, evidence is judged as high quality if all of the following apply: there is a wide range of studies included in the analyses with no major limitations, there is little variation between studies, and the summary estimate has a narrow confidence interval.

Evidence is judged as moderate quality when the Task Force considers that the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different. For example, evidence might be judged as moderate quality if any of the following applies: there are only a few studies and some have limitations but not major flaws, there is some variation between studies, or the confidence interval of the summary estimate is wide.

Evidence is judged to be low or very low quality when the true effect may be substantially different from the estimate of the effect. For example, evidence might be judged as low quality if any of the following applies: the studies have major flaws, there is important variation between studies, or the confidence interval of the summary estimate is very wide.

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Note from the National Guideline Clearinghouse (NGC): A systematic evidence review was prepared by the Evidence Review and Synthesis Centre at McMaster University for the Canadian Task Force on Preventive Health Care (CTFPHC) (see the "Availability of Companion Documents" field).

Quality Assessment, Data Extraction, and Analysis

The titles and abstracts were reviewed in duplicate by members of the synthesis team; any article marked for inclusion by either team member went on to full text rating. Full text inclusion, quality assessment, and data extraction were done by two people. All disagreements were resolved through discussions rather than relying on a particular level of kappa score to indicate when discussions were no longer necessary. The inclusion results were reviewed by a third person. Data were abstracted by two people using a standard format. The exception to this process was studies related to the contextual questions, for which extraction was done by one person.

The strength of evidence was determined based on the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) system of rating quality of evidence using GRADEPro software. This system of grading evidence has been widely used and has been endorsed by over 40 major organizations including the World Health Organization, Centers for Disease Control and Prevention, and the Agency for Healthcare Research and Quality. The GRADE system classifies quality of evidence according to one of four levels: high, moderate, low, and very low. The final grade is based on the risk of bias due to limitations in design, inconsistency of findings, indirectness, imprecision, and publication bias.

The Diabetes Screening Working Group rated each of the outcomes and potential harms of screening using the GRADE Process. GRADE suggests a nine point scale (1-9) to judge the importance of the outcomes and harms. The upper end of the scale, rankings of 7-9, identifies outcomes of critical importance for clinical decision making. Rankings of 4-6 represent outcomes that are important but not critical, while rankings of 1-3 are items that are deemed to be of limited importance to decision making or to patients. This process identified the following important final outcomes: all-cause mortality; cardiovascular mortality; myocardial infarction; stroke; angina; blindness; end stage renal disease; and severe retinopathy. The outcomes of harms associated with diabetes screening resulted in the rankings presented in Table 1 of the systematic review document (see the "Availability of Companion Documents" field).

The GRADE process was also used to assess risk of bias for individual studies addressing Key Questions 1 and 2. This was then used with the summary of findings to assess the overall quality of the evidence. In addition to those required data, the Task Force abstracted data about the patient population, the study design, analysis, and results for each study.

Information to determine the quality of evidence was abstracted in duplicate from the primary methodology paper from each study. Those abstracting the data were blind to each other's ratings. In cases of disagreement, final decisions were determined by consensus after consultation with a third reviewer. All outcomes of interest for Key Questions 1 and 2 are presented separately in the GRADE Evidence Profiles (see Tables 4 and 7 of the systematic review document). Inconsistency and publication bias were rated as "no" and "unlikely" given that the assessments were based on single studies.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Note from the National Guideline Clearinghouse (NGC): A systematic evidence review was prepared by the Evidence Review and Synthesis Centre at McMaster University for the Canadian Task Force on Preventive Health Care (CTFPHC) (see the "Availability of Companion Documents" field).

Task Force Methods

The CTFPHC is an independent panel of clinicians and methodologists that makes recommendations about clinical manoeuvres aimed at primary and secondary prevention. Work on each set of recommendations is led by a workgroup of two to six members of the task force. Each workgroup establishes the research questions and analytical framework for the guideline.

The current work was led by a workgroup of six members of the task force. The recommendations were revised and approved by the entire task force and underwent external review by experts in the field and by stakeholders.

Analytic Framework and Key Questions

The US Preventive Services Task Force (USPSTF) questions and analytic framework were used to guide Key Questions 1 and 2 for the CTFPHC 2011 update (see Figure 1 in the systematic review document for analytic framework).

Key questions:

1. What is the evidence for the clinical benefit of screening for type 2 diabetes using fasting plasma glucose, oral glucose tolerance test (OGTT), or glycated hemoglobin (A1c) in asymptomatic adults 18 years of age or older at high risk or at average and moderate risk for diabetes complications to improve intermediate and final health outcomes?
2. What is the evidence for the harm of screening for type 2 diabetes using fasting plasma glucose, oral glucose tolerance test, or A1c in asymptomatic adults 18 years of age or older at high risk or average and moderate risk for diabetes complications?

Additional contextual questions include:

1. What is the cost effectiveness of screening asymptomatic adults 18 years or older for type 2 diabetes from the perspective of the system and the patients?
2. What are the patient values and preferences related to screening for type 2 diabetes?
3. What risk factors could guide screening for type 2 diabetes (e.g., age, hypertension, hyperlipidemia cholesterol, waist circumference, ethnicity)?
4. What is the evidence that screening for diabetes in Aboriginal people, rural/remote, women, and elderly improve health outcomes and/or mortality?
5. What are the clinical benefits and harms of early treatment (less than 12 months) of patients with type 2 diabetes compared with later treatment of patients for improvement of intermediate or final health outcomes?
6. What are the clinical benefits and harms of treatment of patients with impaired fasting glucose and impaired glucose tolerance compared with no treatment for improvement of intermediate or final health outcomes?
7. What process and outcome performance measures or indicators have been identified in the literature to measure and monitor the impact of screening for type 2 diabetes?
8. What are the most effective (accurate and reliable), risk assessment tools or questionnaires to predict type 2 diabetes?
   8.1 What risk assessment tools or questionnaires to predict type 2 diabetes have been validated in Canada?
9. What is the yield (accuracy, reliability, prevalence, and feasibility) of screening for type 2 diabetes with fasting blood glucose (FBG), OGTT, and A1c in adult patients?

Grading of Recommendations

Recommendations are graded according to the Grading of Recommendations Assessment, Development, and Evaluation system (GRADE). GRADE offers two strengths of recommendation: strong and weak. The strength of recommendation is based on the quality of supporting evidence; the degree of uncertainty about the balance between desirable and undesirable effects; the degree of uncertainty or variability in values and preferences; and the degree of uncertainty about whether the intervention represents a wise use of resources.

Rating Scheme for the Strength of the Recommendations

Grading of Recommendations

- Strong recommendations are those for which the task force is confident that the desirable effects of an intervention outweigh its undesirable effects (strong recommendation for an intervention) or that the undesirable effects of an intervention outweigh its desirable effects (strong recommendation against an intervention). A strong recommendation implies that most people will be best served by the recommended course of action.
- Weak recommendations are those for which the desirable effects probably outweigh the undesirable effects (weak recommendation for an

intervention) or undesirable effects probably outweigh the desirable effects (weak recommendation against an intervention) but appreciable uncertainty exists. A weak recommendation implies that most people would want the recommended course of action but that many would not. For clinicians, this means they must recognize that different choices will be appropriate for each person, and they must help each person arrive at a management decision consistent with his or her values and preferences. Policy-making will require substantial debate and involvement of various stakeholders. Weak recommendations result when the balance between desirable and undesirable effects is small, the quality of evidence is lower, and there is more variability in the values and preferences of patients.

Cost Analysis

A total of six studies related to cost effectiveness of screening for type 2 diabetes were found since the previous 2005 recommendations. However after review through the five step evaluation process only two studies were included for further consideration. The expert results are reported below.

Costs to the Health Care System

In the first reported study, a group of researchers conducted a high-quality model-based study using the Sheffield Diabetes model. The model combines the United Kingdom Prospective Diabetes Study (UKPDS) risk equations with other microvascular complications risk equations to estimate the incidence and costs associated with most major micro and macrovascular complications. The model incorporates published data on glycated haemoglobin (A1c) values at screen detection compared to values at clinical detection along with data on the progression of A1c to estimate time to clinical detection for those detected through screening. Analysis concluded that screening for type 2 diabetes appeared to be cost effective for the 40-70 year age cohort. Screening was more effective for hypertensive and obese individuals, as the costs of screening were offset by lower future treatment costs. However, the authors note that the cost effectiveness of screening is determined by the assumptions given to the degree of glucose control and future treatment protocols.

A 2010 study used a representative sample of the US population to simulate a population of 325,000 people aged 30 years of age and older and tested eight screening strategies compared with a no screening control group. Those strategies included: a) screen the entire population ≥30 years of age (repeat every three years); b) screen entire population ≥45 years of age (repeat every year); c) screen entire population ≥45 years of age (repeat every three years); d) screen entire population ≥45 years of age (repeat every five years); e) screen entire population ≥60 years of age (repeat every three years); f) screen anyone when BP is >140/90 mm/Hg (repeat every year); g) screen anyone when BP is >135/80 mm/Hg (repeat every five years); h) screen entire population ≥30 years of age (repeat every six months). All strategies were effective in that they increased quality adjusted life years (QALYs) when compared to no screening, with screening strategy h) adding the most undiscounted QALYs at 194, and screening strategy e) adding the least QALYs at 93. Based on an incremental analysis, strategy a) would be the optimal strategy assuming a decision maker was willing to pay at least $12,961 per QALY. The authors conclude that starting screening every 3-5 years beginning at age 30 is cost effective.

Method of Guideline Validation

Comparison with Guidelines from Other Groups

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

External Review

Before beginning the review, the protocol was internally reviewed by the Diabetes Screening Working Group which includes members of the Canadian Task Force on Preventive Health Care (CTFPHC) as well as Public Health Agency of Canada staff. The protocol was sent to two external reviewers with review methodology and/or diabetes content expertise; feedback was received from both reviewers and revisions were made. The revised protocol was sent to three reviewers and subsequent revisions were made. A draft of the evidence review went to the Diabetes Screening Working Group, and then the revised review went to a panel of external experts not affiliated with the CTFPHC.

Recommendations of Others

Table 3 of the original guideline document provides a comparison between the current and previous task force guidelines, as well as recommendations from other groups.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate use of screening for type 2 diabetes in adults, which may lead to health benefits

Potential Harms

Screening may lead to overdiagnosis, inappropriate investigation and treatment, avoidable adverse effects, and unnecessary psychosocial and economic costs. However, no studies were found that specifically examined these issues in diabetes. Physical harm associated with diabetes screening may be considered negligible, but psychological and social harm could be more substantial. Despite the absence of evidence, clinicians should remain aware of the potential harm resulting from a positive diagnosis of type 2 diabetes.

Qualifying Statements

Qualifying Statements

The views expressed in this article are those of the authors and do not represent those of the Public Health Agency of Canada.

Implementation of the Guideline

Description of Implementation Strategy

Considerations for Implementation

Calculating Risk in Practice

For the purposes of applying this guideline in practice, either the Finnish Diabetes Risk Score (FINDRISC) or the Canadian Diabetes Risk Assessment Questionnaire (CANRISK) may be used to assess the risk of type 2 diabetes in asymptomatic adults. There is no evidence to guide the optimal frequency of risk calculation. However, on the basis of the evidence for diabetes screening intervals, the task force suggests risk calculation at least every 3–5 years.

No evidence was found to suggest that recommendations on screening Aboriginal people, people in rural or remote areas, women, and elderly people should differ from those for asymptomatic adults in the general population. However, practitioners should be aware that certain ethnic groups (Aboriginal, South Asian, Hispanic, and black people) are at increased risk of diabetes and may be at increased risk of poor health outcomes related to diabetes.

Screening Test in Practice

Depending on the clinical context and patient preferences, clinicians may choose glycated hemoglobin (A1C), fasting glucose measurement, or the oral glucose tolerance test for screening, recognizing that each test may detect a slightly different population of patients with diabetes. An abnormal A1C or fasting glucose level may warrant repeat testing to confirm diagnosis of diabetes. Approximate costs are $6–$8 for A1C, $6–$10 for a fasting blood glucose test and $30 for an oral glucose tolerance test.

Patient Preference

Patients place a high value on clear communication about how screening is done, as well as the potential benefits, harms, and consequences of screening, including the possibility of diabetes being diagnosed. Regardless of the messaging style, patients accepted an invitation to screen if it was important to them. This suggests that patients who accept screening programs want physicians to identify diabetes and its risk factors (if present); to provide clear information about managing risk factors (if screening is negative); and to advise on how to prevent complications of diabetes (if screening is positive). Risk calculators may provide an avenue to inform patients about risk factors and the importance of early lifestyle interventions for those at high and very high risk of diabetes.

Patients with Prediabetes

Although the focus of this guideline is on the detection of diabetes to improve patient-important outcomes rather than on prediabetes, documented prediabetes (impaired fasting glucose or impaired glucose tolerance) is important for risk calculation. A diagnosis of prediabetes puts a patient in the category of very high risk of diabetes.

Role of Other Health Professionals

The task force's work is aimed at family physicians. However, diabetes is one area in which other health professionals, such as registered nurses, pharmacists, and dietitians, play an important role. The initial stage of screening — risk calculation using FINDRISC or CANRISK— does not result in a diagnosis of diabetes; rather, it identifies people at elevated risk in whom more intensive testing is appropriate. Risk calculation may be performed by other health professionals, in a range of settings. A summary of the guidelines has been prepared for use by family physicians and other health professionals (see the "Availability of Companion Documents" field).

Management of Other Cardiovascular Risk Factors

Any benefits of screening for type 2 diabetes likely accrue through management of other cardiovascular risk factors as well as dysglycemia. Therefore, consideration should also be given to assessing and managing other cardiovascular risk factors such as obesity, physical inactivity, tobacco use, hypertension, and dyslipidemia in individuals with diabetes detected through screening.

Suggested Performance Measures

The task force developed a set of performance measures to accompany the diabetes screening guideline for consideration by policy-makers and clinicians (see the original guideline document).

Implementation Tools

Foreign Language Translations

Patient Resources

Quick Reference Guides/Physician Guides

Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Canadian Task Force on Preventive Health Care. Recommendations on screening for type 2 diabetes in adults. CMAJ. 2012 Oct 16;184(15):1687-96. [51 references] PubMed

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

1994 (revised 2012 Oct 16)

Guideline Developer(s)

Canadian Task Force on Preventive Health Care - National Government Agency [Non-U.S.]

Source(s) of Funding

Funding for the Canadian Task Force on Preventive Health Care is provided by the Public Health Agency of Canada and the Canadian Institutes of Health Research.

Guideline Committee

Canadian Task Force on Preventive Health Care (CTFPHC)

Composition of Group That Authored the Guideline

Guidelines Writing Group: Kevin Pottie, Alejandra Jaramillo, Gabriela Lewin, Jim Dickinson, Neil Bell, Paula Brauer, Lesley Dunfield, Michel Joffres, Harminder Singh and Marcello Tonelli

Financial Disclosures/Conflicts of Interest

Competing Interests

Neil Bell has received a research grant from Sanofi-Aventis for an economic analysis of an office-based care model for patients with type 2 diabetes. None of the other members of the guidelines writing group declared competing interests.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Feig DS, Palda VA, Lipscombe L. Screening for type 2 diabetes mellitus to prevent vascular complications: updated recommendations from the Canadian Task Force on Preventive Health Care. CMAJ 2005 Jan 18;172(2):177-80. [44 references]

A complete list of planned reviews, updates, and revisions is available under the What's New section at the Canadian Task Force on Preventive Health Care (CTFPHC) Web site .

Guideline Availability

Electronic copies: Available from the Canadian Task Force on Preventive Health Care (CTFPHC) Web site .

Print copies: Available from Canadian Task Force on Preventive Health Care, Clinical Skills Building, 2nd Floor, Department of Family Medicine, University of Western Ontario, London, Ontario N6A 5C1, Canada.

Availability of Companion Documents

The following are available:

- Screening for type 2 diabetes in adults. Systematic review. Hamilton (Ontario): Evidence Review and Synthesis Centre, McMaster University; 2012 Apr 16. 104 p. Electronic copies: Available in Portable Document Format (PDF) from the Canadian Task Force on Preventive Health Care (CTFPHC) Web site .
- Canadian Task Force on Preventive Health Care methods manual. London (Ontario): Canadian Task Force on Preventive Health Care; 2011 Oct. 86 p. Electronic copies: Available in PDF from the CTFPHC Web site . Also available in French from the CTFPHC Web site .
- GRADE companion document to Task Force Guidelines. London (Ontario): Canadian Task Force on Preventive Health Care; 2011. 2 p. Electronic copies: Available in PDF from the CTFPHC Web site . Also available in French from the CTFPHC Web site .
- Screening for type 2 diabetes in adults. Clinician summary. Canadian Task Force on Preventive Health Care; 2012. 2 p. Electronic copies: Available in PDF from the CTFPHC Web site . Also available in French from the CTFPHC Web site .
- Screening for type 2 diabetes in adults. FINDRISC for clinicians. Canadian Task Force on Preventive Health Care; 2012. 3 p. Electronic copies: Available in PDF from the CTFPHC Web site . Also available in French from the CTFPHC Web site .
- Screening for type 2 diabetes in adults. Frequently asked questions for clinicians. Canadian Task Force on Preventive Health Care; 2012. 2 p. Electronic copies: Clinician FAQ. Available in PDF from the CTFPHC Web site . Also available in French from the CTFPHC Web site .

Patient Resources

The following are available:

- Screening for type 2 diabetes in adults. FINDRISC for patients. Canadian Task Force on Preventive Health Care; 2012. 3 p. Electronic copies: Available in Portable Document Format (PDF) from the Canadian Task Force on Preventive Health Care (CTFPHC) Web site . Also available in French from the CTFPHC Web site .
- Screening for type 2 diabetes in adults. Frequently asked questions for patients. Canadian Task Force on Preventive Health Care; 2012. 3 p. Electronic copies: Available in PDF from the CTFPHC Web site . Also available in French from the CTFPHC Web site .

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients

and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

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